

# Notice of Allowability

Application No.

10/707,069

Examiner

Nghia M. Doan

Applicant(s)

VOLDMAN, STEVEN H.

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed on 11/19/2003 and applicant argument filed on 01/05/2006.
2. ☒ The allowed claim(s) is/are 1-14, 27 and 28 (renumbered 37 CFR 1.73).
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

  
VUTHE SIEK  
PRIMARY EXAMINER

### **DETAILED ACTION**

1. Responsive to communication application 10/707,069 filed on 11/19/2003 and Applicant argument filed on 01/05/2006, claims 1-14 and 27-28 are pending.

Claims 1, 9, 10, and 27 have been amended.

Claims 15-26 have been canceled.

Claim 28 has been added.

2. Applicant's arguments filed 01/05/2006 have been fully considered and the drawing objection and claim objection are obviated.

### ***Allowable Subject Matter***

3. Claims 1-14 and 27-28 are allowed.
4. The following is an examiner's statement of reasons for allowance: the prior art does not teaches or fairly suggest a method of optimizing latchup robustness in integrated circuit for exemplary as claims 1, 9 and 10 comprising steps of: (as per claims 1, 9, and 10) identifying element density of at least one functional circuit block; identifying element attributes of elements associated with the at least one functional circuit block; forming an element density function parameterized from the element attributes; modifying placement of the at least one functional circuit block relative to other functional circuit blocks based on the element density function to substantially eliminate latching effects in a circuit; and  
(as per claim 1) controlling a global placement of the at least one functional circuit block relative to injector source in order to optimize chip performance.  
(as per claim 9) determining magnitude of latchup sensitivity of a specific circuit by":

$$F = \beta_{npn} \beta_{pnp} / [ (I_{DD} + I_{RW} \beta_{npn}) / (I_{DD} - I_{RW} - I_{RS} (\beta_{npn} + 1) / (\beta_{npn})) ]$$

wherein when (i) F is less than 1, then latchup does not occur and (ii) F>1 then latchup will occur.

(as per claim 10) wherein the element density function includes: counting independent BP shapes indicating a number of pnp elements thereby determining a number of p diffusions associated with the at least one functional circuit block; and counting of independent ROX shapes indicating the number of npn elements associated with the at least one functional circuit block.

In the additional as per claim 10, referred to Application Publication PG Pub US 2005/0108670 A1, paragraphs [0115 and 0118], BP is a block mask named, the counting independent BP shapes indicating a number of pnp elements; and ROX is isolation opening, the counting of independent ROX shapes indicating the number of npn elements.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### **Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nghia M. Doan whose telephone number is 571-272-5973. The examiner can normally be reached on 8:30-5:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Chiang can be reached on 571-272-7483. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Nghia M. Doan  
Patent Examiner  
Au 2825  
NMD

*Nghia M. Doan*  
VUTHE CITE  
PRIMARY EXAM...